IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

PETRA KOSCHANY

Serial No.: To be assigned

Filed: December 28, 2001

For: METHOD OF OPERATING A FUEL CELL SYSTEM, AND FUEL CELL SYSTEM OPERABLE ACCORDINGLY

PRELIMINARY AMENDMENT

To the Director of Patents and Trademarks

Sir:

Before considering this application, kindly amend the application as follows:

In the Abstract:

Kindly consider the abstract on the cover sheet of published PCT Application WO 01/73877 A2.

In the Claims:

Kindly amend claims 1-16 as follows:

1. (Amended) A method of how to operate a fuel cell system which comprises at least one active membrane sandwiched between an anode layer and a cathode layer and comprising a catalyst, and a fuel supply having access to the anode layer and an air supply having access to the cathode layer, wherein the air supplied by the air supply is introduced by pressure into the fuel cell system, passes along the cathode layer and then leaves

the fuel cell system, and is used for both oxidant and coolant, characterized in that the air is introduced into the fuel cell system with a rate resulting in a stoichiometric rate in the range between 25 and 140.

2. (Amended) Method according to claim 1, wherein the stoichiometric rate is in the range between 45 and 90.

3. (Amended) Method according to claim 1, wherein the air flow direction within said fuel cell system is alternatingly reversed after certain time spans.

4. (Amended) A fuel cell system adapted to be operated according to the method of claim 1, the fuel cell system comprising at least one active membrane sandwiched between an anode layer and a cathode layer and comprising a catalyst, and a fuel supply having access to the anode layer and an air supply having access to the cathode layer, wherein the cathode layer(s) or a part of the cathode layers is equipped with air penetrating ducts allowing an air flow parallel to the membrane at a flow rate resulting in a stoichiometric rate in the range between 25 and 140.

5. (Amended) Fuel cell system according to claim 4, wherein the air penetrating ducts are formed in an air conducting layer which is adjacent and in contact to the cathode layer the latter one having diffusion properties.

6. (Amended) Fuel cell system according to claim 4, wherein the air penetrating ducts consist of channels formed in

the cathode layer or in the air conducting layer and extending along the air flow path.

7. (Amended) Fuel cell system according to claim 6, wherein in the flow direction, the total of the channel section area decreases.

8. (Amended) Fuel cell system according to claim 4, wherein it comprises a fuel cell stack which has a geometrical form of a parallelepiped with a rectangular traverse section wherein the air penetrating ducts of each single cell are directed parallel to the short edge of the rectangle.

9. (Amended) Fuel cell system according to claim 4, wherein it comprises a fuel cell stack which has a geometrical form close to a cylinder, and has individual cells each comprising an active area in the form of a circular ring, the circular rings in the stack delimiting a central tube within the stack from which tube the air penetrating ducts spread and direct the air flow radially through the individual cells.

10. (Amended) Fuel cell system according to claim 9, wherein the air flow is generated by one or two blowers located at one or two endplates of the fuel cell stack.

11. (Amended) Fuel cell system according to claim 4, wherein it comprises a fuel cell stack with gas separator plates between the single fuel cells, and wherein the material of said gas separator plates has a ratio heat conductivity parallel to the membrane to density of > 0.04 W $m^2/(kg\ K)$.

12. (Amended) Fuel cell system according to claim 11, wherein the material of the gas separator plates is a foil made of expanded graphite.

13. (Amended) Fuel cell system according to claim 4, wherein the single fuel cell at its cathode side comprises a diffusion structure wherein an air filter is contained.

14. (Amended) Fuel cell system according to claim 13, wherein said air filter is made of a layer sheet material which is strongly hydrophobic and comprises small pore sizes.

15. (Amended) Fuel cell system according to claim 14, wherein the material of the air filter is a porous stretched PTFE foil filled among others with an electrically conductive material.

16. (Amended) Fuel cell system according to claim 15, wherein the PTFE foil is further compressed and impregnated with a PTFE detergent suspension.

REMARKS UNDER 37 C.F.R. 1.111

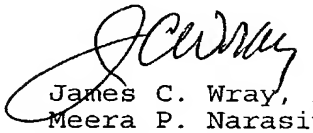
Reconsideration and allowance are respectfully requested.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**".

Applicant has also provided an abstract in compliance with the rules.

Entry of the amendment and consideration and allowance of all claims are respectfully requested.

Respectfully,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claims 1-16 have been amended as below:

1. (Amended) A method of how to operate a fuel cell system [(1, 15)] which comprises at least one active membrane [(2)] sandwiched between an anode layer [(4)] and a cathode layer [(3)] and comprising a catalyst, and a fuel supply having access to the anode layer and an air supply [(17, 18)] having access to the cathode layer, wherein the air supplied by the air supply is introduced by pressure into the fuel cell system, passes along the cathode layer and then leaves the fuel cell system, and is used for both oxidant and coolant, characterized in that the air is introduced into the fuel cell system [(1, 15)] with a rate resulting in a stoichiometric rate in the range between 25 and 140.

2. (Amended) Method according to claim 1, [characterized in that] wherein the stoichiometric rate is in the range between 45 and 90.

3. (Amended) Method according to claim 1 [or 2], [characterized in that] wherein the air flow direction within said fuel cell system [(15)] is alternatingly reversed after certain time spans.

4. (Amended) A fuel cell system adapted to be operated according to the method of [any of claims 1 to 3] claim 1, the fuel cell system [(1, 15)] comprising at least one active membrane [(2)] sandwiched between an anode layer [(4)] and a

cathode layer [(3)] and comprising a catalyst, and a fuel supply having access to the anode layer and an air supply [(17, 18)] having access to the cathode layer, [characterized in that] wherein the cathode layer(s) [(3)] or a part of the cathode layers is equipped with air penetrating ducts allowing an air flow parallel to the membrane [(2)] at a flow rate resulting in a stoichiometric rate in the range between 25 and 140.

5. (Amended) Fuel cell system according to claim 4, [characterized in that] wherein the air penetrating ducts are formed in an air conducting layer [(10)] which is adjacent and in contact to the cathode layer [(3)], the latter one having diffusion properties.

6. (Amended) Fuel cell system according to claim 4 [or 5], [characterized in that] wherein the air penetrating ducts consist of channels [(11)] formed in the cathode layer [(3)] or in the air conducting layer [(10)] and extending along the air flow path.

7. (Amended) Fuel cell system according to claim 6, [characterized in that] wherein in the flow direction, the total of the channel [(11)] section area decreases.

8. (Amended) Fuel cell system according to [any of claims 4 to 7] claim 4, [characterized in that] wherein it comprises a fuel cell stack which has a geometrical form of a parallelepiped with a rectangular traverse section wherein the air penetrating ducts [(10)] of each single cell [(1)] are directed parallel to the short edge of the rectangle.

9. (Amended) Fuel cell system according to [any of claims 4 to 7] claim 4, [characterized in that] wherein it comprises a fuel cell stack [(15)] which has a geometrical form close to a cylinder, and has individual cells [(1)] each comprising an active area in the form of a circular ring, the circular rings in the stack delimiting a central tube [(16)] within the stack from which tube the air penetrating ducts [(10)] spread and direct the air flow radially through the individual cells.

10. (Amended) Fuel cell system according to claim 9, [characterized in that] wherein the air flow is generated by one or two blowers [(18)] located at one or two endplates [(19)] of the fuel cell stack [(15)].

11. (Amended) Fuel cell system according to [any of claims 4 to 10] claim 4, [characterized in that] wherein it comprises a fuel cell stack [(15)] with gas separator plates [(5)] between the single fuel cells [(1)], and wherein the material of said gas separator plates has a ratio heat conductivity parallel to the membrane to density of > 0.04 W m^2/(kg K).

12. (Amended) Fuel cell system according to claim 11, [characterized in that] wherein the material of the gas separator plates [(5)] is a foil made of expanded graphite.

13. (Amended) Fuel cell system according to [any of claims 4 to 12] claim 4, [characterized in that] wherein the single fuel cell [(1)] at its cathode side comprises a diffusion structure wherein an air filter is contained.

14. (Amended) Fuel cell system according to claim 13, [characterized in that] wherein said air filter is made of a layer sheet material which is strongly hydrophobic and comprises small pore sizes.

15. (Amended) Fuel cell system according to claim 14, [characterized in that] wherein the material of the air filter is a porous stretched PTFE foil filled among others with an electrically conductive material.

16. (Amended) Fuel cell system according to claim 15, [characterized in that] wherein the PTFE foil is further compressed and impregnated with a PTFE detergent suspension.